

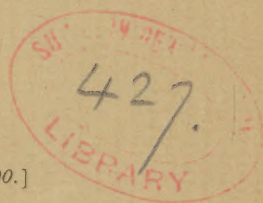
Scudder (C.L.)

CONGENITAL DISLOCATION
OF THE
SHOULDER-JOINT:

A
REPORT OF TWO CASES.

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CONGENITAL DISLOCATION OF THE SHOULDER-JOINT:

A REPORT OF TWO CASES.

THE etiology and the pathology of the congenital deformity of the *foot*, commonly known as talipes equino-varus, has been pretty satisfactorily determined, and the rational treatment of this deformity in its varying degrees of severity is already established. The etiology and the pathology of congenital dislocations of the *hip*-joint are likewise determined, but the treatment is not yet, save in three or four instances, satisfactory. In congenital dislocations of the *shoulder*, on the other hand, very little progress has been made. I have to report two cases of this deformity which came recently under my observation, and which are of interest because of their extreme rarity.

CASE I.—A boy, nine years old, of Irish parentage, with a good family and personal history, is the second of four children. The mother suffered no injury during her pregnancy with this child, and was delivered manually, with ease, at full term, the head presenting. At present this boy is fairly well nourished, and a little under the average height and weight.

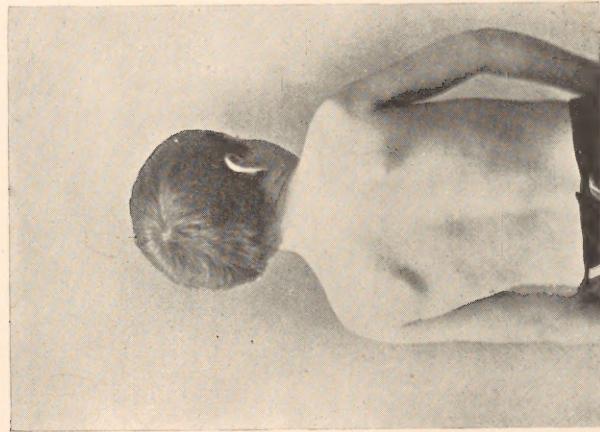
Attitude.—He stands as shown in the photograph. The right shoulder and right upper extremity at once attract attention. The right elbow is abducted three inches from the side, and the forearm and humerus are slightly flexed. The whole

arm is rotated inward ; the forearm is pronated. The humerus is so rotated that the internal condyle looks backward, and the olecranon process of the ulna looks outward. A distinct depression is seen in the infra- and supraspinous fossæ. The right pectoralis major appears smaller than the left. A rounded prominence is seen under the outer half of the spine of the scapula, a little behind the acromion process, and about the size of a large horse-chestnut. This prominence is hard, of slightly irregular surface, which is continuous with a smoother portion nearer the chest wall, and this latter is continuous with the shaft of the humerus. This prominence is movable with the shaft of the humerus, and is the head of that bone. The scapula is small ; the glenoid cavity cannot be felt ; the acromion process is in close apposition to the coracoid process, and is better developed than in the second case.

Voluntary movements.—The voluntary movements are all feebler than on the other side, and are greatly limited, by the position of the head of the humerus, in abduction, flexion, extension, and especially in abduction across the chest. Flexion and extension of the forearm are very much weaker than upon the left side. The movement of extension is not completed voluntarily, but the arm will allow complete passive extension. Pronation and supination are slightly limited by the position of the whole upper extremity. Rotation of the humerus is accompanied by greater movement of the scapula than upon the left side. Passive rotation of the humerus is greatly limited because of the contact of the head of the bone with the spine of the scapula. The vertebral spines present a slight, long, lateral, flexible curve, with the convexity to the left side. There is no rotation of the vertebral bodies. Trac-tion upon the arm at the elbow in varying positions, with counter-extension upon the scapula, does not alter the relative position of the head of the humerus upon the right side.

MEASUREMENTS.

Length of right clavicle	3 3-4 inches.
“ “ left “	4 1-2 “
From acromion to external condyle of right humerus	8 1-4 “



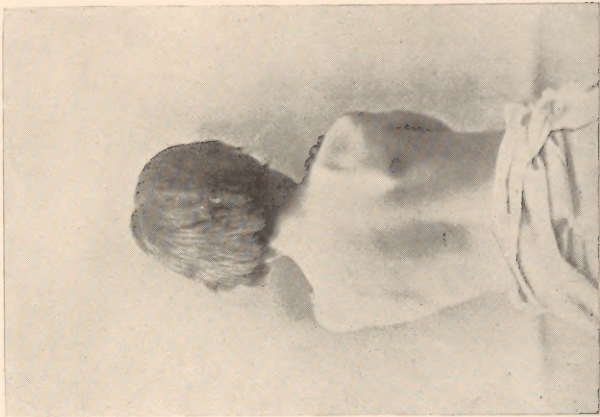
CASE I.

Notice position of the arm. Prominence of humeral head. Small scapula. Depression in infrapinatus fossa. *Slight* lateral curve to the left of vertebral spines.



CASE II.

Notice position of the arm; shape of shoulders, short clavicle. Flat chest on the right side.



CASE II.

Small scapula. Humeral head on the right side. Hands on shoulders.

From acromion to external condyle of left humerus	9 1-2 inches.
Circumference of right upper arm	6 1-4 "
" " left " "	7 1-4 "
Circumference of right forearm	5 1-2 "
" " left " "	7 1-2 "
Length of right radius	7 1-2 "
" " left " "	7 3-4 "
Length of right ulna	7 1-2 "
" " left " "	7 3-4 "

At the level of a plane, passing three-fourths of an inch above the nipple in front and through the fifth dorsal spine behind,

The right chest measures	13 inches.
" left " "	14 "

The length and circumference of the thighs are alike; the circumference of the legs is the same.

CASE II.—A girl, seven years old, of the same Irish parentage as that of Case I., with a good family and personal history, is the third of four children. The mother suffered no injury during her pregnancy with *this* child, and was delivered without the aid of instruments, at full term, the head presenting. At present this girl is a little under size and weight, and fairly well nourished.

Attitude.—She stands as is seen in the photographs. The right elbow is naturally held away from the side, the forearm and humerus are both slightly flexed. The forearm is pronated completely. The humerus is rotated farther inward than in the first case, so that the internal condyle looks *backward* and *outward*, and the olecranon process of the ulna looks outward and very slightly forward. The head of the humerus is felt under the outer third of the spine of the scapula, a little back of the acromion process.

The voluntary movements are limited, as in the first case. The glenoid cavity cannot be felt. The scapula is small. The acromio-clavicular joint is very prominent on the right side. The coracoid process can be seen upon the right side, in close proximity to the acromion, which is small. The vertebral spines are slightly curved to the left in the dorsal region. There is no rotation of the vertebral bodies. Traction, as in Case I., causes no change in the relative position of the humeral head.

MEASUREMENTS.

Length of right clavicle	3 3-4 inches.
" " left "	4 1-8 "
From acromion to external condyle of right humerus	7 1-2 "
From acromion to external condyle of left humerus	9 "
Circumference of right upper arm	6 "
" " left " "	6 1-4 "
Circumference of right forearm	5 1-2 "
" " left " "	6 "
Length of right radius	7 "
" " left " "	7 1-4 "
Length of right ulna	7 "
" " left " "	7 1-4 "
Right half of chest measures	11 1-2 "
Left " " " "	12 "

The right pectoral muscle is smaller than the left. The vertebral border of the scapula upon the right side measures four inches; upon the left side it measures five inches.

From the acromion to the inferior angle of the right scapula is 5 1-2 inches.

From the acromion to the inferior angle of the left scapula is 6 1-2 "

The length and circumference of the thighs are the same.

The circumference of the calves are the same.

Electrical test.—Through the very great kindness of Dr. William N. Bullard, of Boston, who made the electrical tests of the muscles in these two children, it is possible to make the following report. The faradic reactions in the two children did not show anything remarkable.

Galvanism.—In the boy (Case I.) the right biceps was increased; the deltoids were alike; the right trapezius was slightly diminished. In the girl (Case II.) there was "not much difference detected" in the two sides. There is no reaction of degeneration present in either case.

Brief summary of cases.—These cases present very similar signs. Two children, one seven and the other nine years of age, are born of the same parents, each by a normal labor, the middle two of four children. The attending physician discovers at birth nothing wrong with the shoulders of either child. Some time after birth the mother notices that the right arm in each case is not handled by the child as easily as is the

left one. As the child grows this disability increases; there is, however, no pain at any time, but at the end of seven and nine years, respectively, neither can feed himself with the right hand, and each is hindered from the proper use of the right arm. During this period the clavicle, scapula, and humerus, and the muscles of the scapular group, noticeably the supra- and infraspinatus, the deltoid and the pectoralis major, together with the muscles of the upper and forearms, in each case do not grow. Because of this lack of *muscular* development the various bony prominences of the shoulder come out in bold relief. The deformity is increasing, and with it is an increasing disability. The deformity of the upper extremity is noticed by all,—viz., the arm held from the side, rotated inward, and pronated. This is a clinical picture of no very doubtful kind.

According to Von Ammon, each of these cases should be considered a true congenital dislocation, or, more accurately, a congenital misplacement of the shoulder-joint.

The deformity was overlooked at birth because it was not looked for, and the differences in the two sides were not so marked as to attract attention. But it was noticed a few days or weeks later, and the child used the arm, but imperfectly.

So-called congenital dislocations may be due to traumatism, causing paralysis of certain muscles of the shoulder, either by the pressure of the forceps on the brachial plexus at the side of the neck or by direct traction upon the arm.

In *these* cases traumatism has played no part. From the electrical reaction of the muscles it is certain that there is now no paralysis; and that there has been none is rendered very probable from the facts, first, that no spastic condition is present in any of the muscles about the joint, and, second, that the electrical reaction is very nearly the same on the two sides.

The positive evidence, however, against the deformity being a paralytic one is the fact of the small size of the bones of the right shoulder compared with those of the left. The difference is too marked to be explained simply by disuse and paralysis of the affected side. Then add to this the anatomical conditions present, and the evidence is conclusive that in these two cases there is present no paralytic deformity due to

traumatism, but a purely congenital affection,—a congenital misplacement of the shoulder-joint with resulting deformity.

To have determined that it is congenital is not sufficient. In the case of the hip-joint, where a large amount of work has been done to determine the etiology, it has been demonstrated by Grawitz* that the primary cause of congenital dislocations is the failure of the Y cartilage of the acetabulum to complete the growth of one or all of the segments of the os innominatum. The appearances in the femur were those of normal growth. This inequality in the growth of the acetabulum and femur—in other words, the arrested development of one portion of the hip-joint and the normal development of all other parts of the joint—explains the production of the deformity.

In the case of the common congenital dislocation of the foot, talipes equino-varus, an arrest of development of all tissues of the part, and noticeably a portion of the astragalus, is sufficient to explain the occurrence of the deformity, and to indicate its rational treatment.

R. W. Smith, in 1839, is the first and only one who has described the appearances found in congenital dislocation of the shoulder-joint. He made autopsies upon two cases, each with double dislocations. He found the original glenoid cavity lacking or rudimentary, and the new one well developed, either immediately under the coracoid process, or on the outer side of the scapula, below the acromion. These are the only post-mortem examinations recorded, with the exception of one made by Küster in a doubtful case, where the glenoid cavity was found small and undeveloped, with a normally developed humeral head resting upon one edge of it. The weight of evidence goes to prove that congenital dislocations in *general* are due to defective formation, or the arrested development, of one or more of the bones constituting the joint. Unlike dislocations from traumatic causes, the head of the bone need never have left its corresponding joint surface. In certain exceptional cases pathological changes in some other constituent of the joint may be a factor in causing a dislocation,

* *Virch. Archiv.*, 1878, vol. lxxiv. p. 1.

and there may be present occasionally a mechanical factor, acting in utero.

In the two cases reported to-night there is almost the condition of the bones and joints represented in one of the plates given by Smith. There is present no ordinary dislocation, with secondary atrophy from disuse, but there is an undeveloped clavicle and upon an undeveloped scapula a glenoid cavity placed back a little, under the outer portion of the spine of the scapula, looking forward and inward, far enough backward to be considered subspinous, although almost sub-acromial.

We find, then, in these two cases, a congenital arrest of development.

Explanation of details of position.—The rotation inward of the whole arm is due to the anatomical arrangement of the parts, chiefly to the position of the glenoid cavity.

Muscular spasm is absent in the internal rotators of the humerus.

But habitual use, from the necessity of anatomical relations, with a resulting development of certain muscles, may be a factor in determining the permanency of the position of the arm.

The flexion and abduction of the humerus are evidently due to a locking of the head of the humerus under the spinous process of the scapula in its glenoid cavity. There is no unusual twist in the shaft of the bone.

The projection of the inferior angle of the scapula is increased when an attempt is made to force the elbow to the side and at the same time to extend the humerus.

The most frequent congenital dislocation is that of the hip; next, that of the shoulder, and then that of the head of the radius.

The records of Von Langenbeck's Polyclinic show ninety congenital dislocations of the hip, five of the shoulder, two of the head of the radius, and one of the knee. In all medical literature I can find but *twelve* well-defined cases of congenital dislocation of the shoulder-joint, and I find no other instance of two cases occurring in the same family. The fact of a brother and sister presenting this deformity certainly suggests

an hereditary influence present, and adds additional support to the idea of a congenital origin in these cases.

Of the twelve cases of congenital dislocation of the shoulder-joint reported, five were subacromial, five were subcoracoid, and two were subspinous. These cases were reported by Guérin, Smith, Küster, and Krönlein.

Diagnosis.—It is of very great importance to distinguish this deformity from that occurring during delivery, and which is due to paralysis. This has been described by Duchenne, of Boulogne, and may be caused, as has been already mentioned, by the pressure of the forceps on the brachial plexus at the side of the neck, or may be due to direct traction on the arm. When all the muscles of the shoulder are paralyzed, the displacement is always downward and forward, and incomplete. When the paralysis is partial, the displacement is affected by the non-paralyzed muscles. In new-born children, deformity of the shoulder, due to paralysis, is said to be always subacromial. The deltoid, infraspinatus, brachialis anticus, and biceps are the muscles usually affected. In some cases there is paralysis of the muscles of the forearm and hand, supplied by the musculo-spiral nerve.

Cases of traumatic dislocation at birth without any real paralysis may occur which may be confounded at the time with a true congenital dislocation unless care is taken.

Prognosis.—The prognosis in these cases is certain if untreated, and uncertain if treated. Usually, when untreated, the disability and the deformity increase with age, the contrast between the undeveloped shoulder and its fellow becoming more apparent with the lapse of time.

Treatment.—In these particular cases the parents will allow nothing to be done.

Nothing has ever been attempted in the treatment of this deformity either mechanical or operative.

There are present in these cases limitation of motion and undeveloped muscles. Greater usefulness of the limb and the absence of deformity are sought. The indications, therefore, are for greater range of joint-motion and greater muscular development in certain groups of muscles.

The accomplishment of the first without the second would

be useless. The accomplishment of the second without the first might be of advantage. To accomplish the first object three methods might be pursued :

(1) Wiring the humeral head to the glenoid cavity ; advantage could thus be taken of the scapula muscles in movements of the humerus, the mobility of the scapula in these cases being very great.

(2) Excision of the head of the humerus.

(3) Removal of the portion of the scapula spine offering obstruction to motion.

Whenever there is doubt as to the possibility of obtaining greater muscular development, every attempt should be made in this direction before operative procedures are entered upon.

The deformity is a serious one, and radical methods are called for. The muscles, as we have seen from the electrical examination, show no degeneration reaction. There is muscular tissue present, and it is a question to be determined in the future, how much usefulness may be obtained by careful and systematic electrical treatment. In two or three cases of congenital dislocation of the *hip*-joint successful attempts at *traction* have been made, the head of the femur having been retained a sufficient length of time in contact with the os innominatum to cause the formation of a new joint about the head of the bone. With a proper retentive apparatus, such cases have had a functionally useful limb.

In congenital dislocations of the shoulder-joint, on the other hand, *traction* would be of no use, for there is no bony prominence, save the ribs of the chest wall, to which the head of the humerus could be drawn, and in both the cases reported it was impossible, by means of considerable traction upon the humerus in various directions, to move the head of the bone from its place.

Something can be accomplished without operation.

The normal reflexes are disturbed in the upper extremity.

By instruction, these reflexes may be developed and the child taught to enjoy the using of what muscular power he has to the best possible advantage.

NOTE.—I am greatly indebted to Dr. F. W. Whittlesey, of Great Barrington, Mass., for assistance in obtaining photographs of these cases.

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